

A NEW SPECIES OF THE SUBGENUS *SIMULIUM* *MONTISIMULIUM* FROM SICHUAN, CHINA (DIPTERA, SIMULIIDAE)

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Abstract The present paper reports a new species, *Simulium* (*Montisimulium*) *heishuiense* sp. nov. (Diptera, Simuliidae), from Heishui, Sichuan Province, China. The specific name was given by the type locality. This new species can be readily separated from several known related species by the pupal filaments branching and the shape of the male genitalia.

Key words Diptera, Simuliidae, *Simulium* (*Montisimulium*), new species, Sichuan Province.

The subgenus *Montisimulium* contains about 60 species (1 200–3 000 m) and are mainly distributed in East Asia, Russia (Siberia), Mongolia, Burma, Japan, India, Pakistan and China. Fourteen of the subgenus are recorded from China. In this paper, the authors report a new species of the subgenus from Sichuan, China. The type specimens are kept in the Department of Biology of Guiyang Medical College.

Simulium (*Simulium*) *heishuiense* **Chen and Wen, sp. nov.** (Figs. 1–17)

Female. Body length 4.0–4.3 mm. Wing length 3.8–4.0 mm.

Head. Narrower than thorax. Venter and frons dark brown, not shiny and with yellowish white hairs. Clypeus dark grey, whitish grey pruinose and covered with a few golden recumbent hairs. Frontal ratio 9.5: 5.1: 7.7, Frons: head ratio 9.5: 32.1. Antenna composed of 2+9 segments, brownish black except scape and pedicel pale yellow; 1st flagellar segment about 1.5 times as long as the following one. Maxillary palp blackish, composed of 5 segments with proportional length of 3rd, 4th and 5th segments 7.0: 5.1: 11.3; 3rd segment somewhat enlarged; sensory vesicle ellipsoidal, which is about 2.0 times as long as wide and about 1/2 as long as respective segment. Maxilla with 9 inner teeth and 14 outer ones. Mandible with 25 inner teeth and lacking outer ones. Cibarium without denticles on posterior border.

Thorax. Scutum black and densely covered with recumbent yellowish white pubescence as well as sparse erect black hairs on prescutellar area. Scutellum brown, with erect black hairs as well as yellowish white hairs. Postscutellum brown, bare. Pleural

membrane and katepisternum bare. Legs. Brownish black except fore trochanter, basal 3/4 of all femora yellowish brown and median large portion of all tibiae and hind basitarsus and basal 1/2 of 2nd tarsomere grayish yellow. Fore basitarsus slender, about 8.0 times as long as wide. Hind basitarsus nearly parallel-side, about 7.0 times as long as wide. Calcipala and pedisulcus well developed. Each claw with large basal tooth which is about 1/3 of claw. Wing. Costa with heavy stout black spine intermixed with erect black hairs. Subcosta hairy. Hair tuft on basal of costa and stem vein brown. Radius entirely haired.

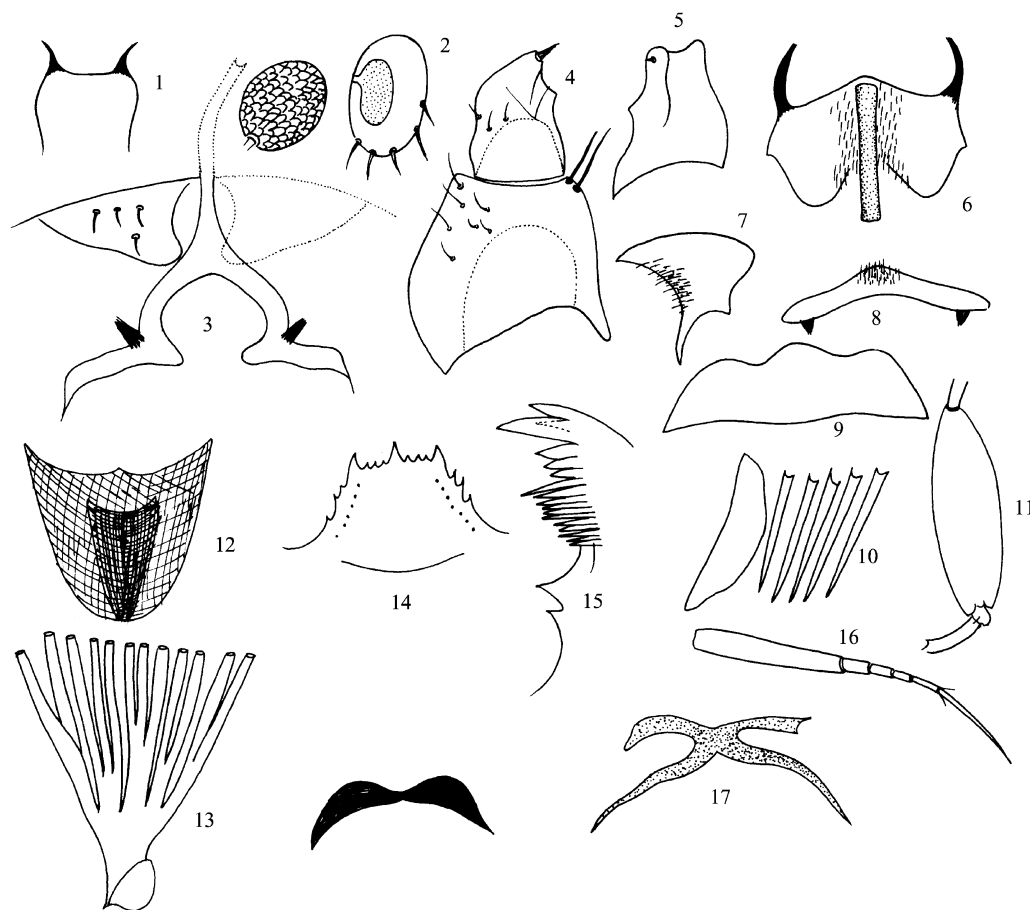
Abdomen. Basal scale grey brown with a fringe of golden marginal hairs. Terga dark grey. Genitalia. Sternite 8 with about 40 hairs on each side. Anterior gonapophyses triangular, inner margins somewhat diverged and laterally posterior border rounded. Stem of genital fork strongly sclerotized, arms moderately wide, each with small sclerotized projection directed forwards and weakly sclerotized process inwards. Spermatheca elliptical and with distinct reticulate pattern. Paraproct of moderate size. Cercus about 2.2 times as long as wide.

Male. Body length about 4.0 mm. Wing length about 3.0 mm.

Head. As wide as thorax. Upper eye consisting of about 18 horizontal rows and 15 vertical rows of large facets. Clypeus brownish grey, with sparse brown hairs. Antenna greyish black, composed of 2+9 segments; 1st flagellar segment about 2.0 times of the next in length. Maxillary palp with 5 segments with proportional length of 3rd, 4th and 5th segments 5.5: 5.8: 10.4; 3rd segment enlarged, sensory vesicle elliptic in shape which is about 1/3 length of respective

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Figs 1-17. *Simulium* (*Simulium*) *hashuiense* sp. nov. 1. Glibar. 2. 3rd segment of maxillary palp. 3. Female genitalia. 4. Coxite and style of male. 5. Style of male, lateral view. 6. Ventral plate and median sclerite of male, ventral view. 7. Ventral plate, end view. 8. Ventral plate, lateral view. 9. Parameral hook. 10. Notum. 11. Coxa of hind leg of male. 12. Respiratory Filaments. 13. Cocoon. 14. Larval head capsules, ventral view. 15. Larval mandible. 16. Larval antenna. 17. Anal sclerite.

segment.

Thorax. Scutum black, not shiny, densely covered with golden yellow pubescence and with several erect black hairs on prescutellar area. Scutellum brownish black with several erect black hairs. Postscutellum black and bare. Pleural membrane and katapisternum bare. Legs. As in female except hind basitarsus enlarged, somewhat spindle-shaped, about 4.2 times as long as its maximum width. Wing. As in female except subcosta bare.

Abdomen. Nearly as in female. Genitalia. Coxite subconical, nearly as long as wide. Style small, about 2/3 length of coxite, with a stout apical spine; when viewed ventrolateral, style abruptly narrow apically and twisted inwards. Ventral plate lamellate, much wider than long, butterfly in shape, with a distal margin concave medial and proximal margin convex; lateral margin each having a hornlike sub-middle process; setose medially; arms well sclerotized, somewhat convergent apically. Parameres each with 4

strongly parameral hooks. Median sclerite rod in shape.

Pupa. Body length about 4.0 mm.

Head and thorax. Integument yellowish brown, moderately covered with black cone-like tubercles. 3 pairs of head trichomes all simple, whereas thorax with 6 pairs of slender and simple trichomes. Gill with 12 filaments, approximately 1/2 times as long as pupal body and arranged in groups of 2, 3, 3, 4 from dorsal to ventral; all filaments directed forwards close together, tapering distally and with numerous transverse ridges forming reticulate pattern and densely covered with minute tubercles.

Abdomen. Terga 1-4 tuberculate; tergum 2 with 5 short slender setae and 1 longer seta on each side; terga 3 and 4 each with 4 hooked spines on each side; terga 5-8 each with spine combs on each side; tergum 9 with a pair of well developed terminal hooks. Sternum 5 with a pair of bifid hooks submedially; sterna 6 and 7 each with a pair of bifid hooks widely spaced on each

side. Cocoon. Simple, slipper-shaped, tightly woven, extending ventrolaterally and with a thick anterior margin.

Mature larva. Body length about 7.0 mm. Cephalic apodome brown, with definite positive spots. Antenna composed of 4 segments in proportion lengths from base to tip 5.9: 4.3: 4.0: 0.2; segment 2 with 3 or 4 pale annulets. Head fan with about 32 main rays. Mandible without supernumerary serration, comb-teeth unequal in length, 1st tooth longer than others. Hypostomium with a row of 9 apical teeth and its corner and median teeth strongly developed; middle tooth of intermediate ones smallest; lateral serrations well developed; 6 or 7 hypostomal bristles lying parallel to lateral margin on each side. Postgenal cleft very minute. Thoracic and abdominal integument bare. Rectal gill lobes compound, each with 4-6 finger-like secondary lobules. Anal sclerite X-formed with anterior short arms about 1/2 times as long as posterior ones. accessory sclerite absent. Posterior circlet with about 86 rows of up to 16 hooklets per row. Ventral papillae well developed.

Holotype ♀, slide mounting with pupal skin and cocoon, Kalonggou, Heishuixian, Sichuan Province, China (32° 05' N, 102° 59' E; alt. 2 400 m), 1 Aug. 2005. Paratypes: 1 ♀, 6 ♂, pinned with pupal skin and cocoon, 21 pupae and 12 mature larvae, all slide mounted, same data as holotype. Pupae and larvae were collected on stone and fallen leaves in a small stream by LIU Dan and HOU Xiao Hui.

Distribution. Sichuan Province, China.

四川山蚋亚属一新种 (双翅目, 蚋科)

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摘要 记述采自四川黑水县卡龙沟蚋科 1 新种, 新种与泰山山蚋 *S. (M.) taishanense*、林芝山蚋 *S. (M.) linzhiense*、线丝山蚋 *S. (M.) nemorivagum* 和塔吉克山蚋 *S. (M.) kirgisorum* 近似, 均具简单的蛹茧和 12 条呼吸丝, 排列为 2, 3, 3, 4, 但可依其蛹呼吸丝具极短的初级茎和次级茎, 雄性生殖腹板

关键词 双翅目, 蚋科, 蚋属山蚋亚属, 新种.

中图分类号 Q969.442.9

Remarks. This new species seems closely related to *S. (M.) taishanense* Sun and Li from Shandong, China by having the simple cocoon, the 12 filaments arranged in groups of 2, 3, 3, 4 and the shape of male ventral plate. The new species, however, can be readily separated from the latter species by the pupal filaments with the very short primary and secondary stalk, and the lateral margins male the ventral plate with a horn-like sub-middle process.

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侧缘具亚中突起等特征加以区别。

正模♀, 副模 1 ♀, 6 ♂, 21 蛹和 12 幼虫, 均系于 2005 年 8 月 1 日采自四川省黑水县卡龙沟小溪急流的石块和枯枝落叶中。